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SALISBURY'S AUTOMATIC ENGINEER OR Feed-Water Attachment for Boilers.

Patented in the United States, Canada, Great Britain and other Countries.

THE USE OF THE ATTACHMENT.

The simplicity of the construction of the apparatus, and of the principles illustrated in its operation, as well as the precision with which it performs its work, commend it to every observer, and has called forth expressions of surprise and admiration from those who have seen it in operation. It is offered to the public as the most reliable and valuable invention ever made for the protection of life and property where steam generators are used.

Steam is the great motive power of the world, yet it is the most dangerous, and requires the most careful watching to prevent dreadful accidents. Nevertheless, the engineers employed in our large establishments are constantly called away from their legitimate duties to look after other matters to which they seem to think no one else can attend, while they are strictly held responsible and are subject to indictment if a loss of life occurs from any accident. Here is just where this Automatic Engineer comes in and performs the great essential duty of insuring that the water in the boiler will stand exactly at the point where the most effective results, with the greatest economy, are obtained, supplying the water in quantities just equal to the evaporation. Let the requirements be great or small, it will just meet such requirements, no more and no less. It never sleeps nor tires, and is not liable to get out of order, or require any repairs for years; it works with the accuracy of a chronometer, having been subjected to the severest scientific tests that the most eminent engineers could suggest, during several years past. It is now offered with perfect confidence that it possesses the following remarkable advantages.

The scientific reasons, and statements of causes and effects are given, which must at once secure the fullest approbation of every engineer and manufacturer, as well as commend it to the common sense of the general public.

1. It absolutely protects a boiler from any chance of an explosion for want of sufficient water in the boiler.

2. It extends the life and usefulness of a boiler threefold, entirely removing the principal practical causes of deterioration, viz : by preventing the frequent and extreme strains caused by the contraction and expansion of the boiler arising from the pumping into it at intervals, fresh water to supply what is lost by evaporation. Each time this occurs every fine particle of fibre of the iron is acted upon, and eventually its adhesive qualities are affected, and a gradual diminution of strength ensues. This is verified by the records of the Government Boiler Inspectors, which show that each year the power of boilers is reduced fully one-fifth of their pressure allowance.

3. It saves the time expended in repairing leaks and other damages that follow such extreme and sudden changes in temperature.

4. It avoids the very great loss caused by the sudden decrease of pressure occasioned by pumping in quantities of fresh water every half hour. Even with water at 140 deg. the pressure is reduced from 60 down to 50 lbs., as has been shown by exhaustive experiments extending over a long period, and this reduction of pressure means sudden reduction of speed, which materially lessens the quantity as well as produces deterioration in the quality of manufactured goods. The losses occurring from this cause are often even greater than the entire cost of the fuel required to run the mills or factory.

5. It economizes fuel. It is obvious that it requires more time and more fuel to heat a large quantity of water in a given time than it does to heat a small quantity. This automatic regulator supplies water constantly in such small quantities, being the exact requirement according to evaporation, that it does not change the temperature of the water in the boiler one degree, and the fires can be kept up by the use of the minimum quantity of fuel.

On the contrary, when the pressure of steam is reduced by the introduction of a large quantity of water, it must be reproduced by fresh fires and cleaning, involving a large consumption of fuel and incidentally exposing the hottest parts of the boiler to frequent draughts of cold air, which reduce the temperature and occasion the rapid contraction and expansion so very destructive to boilers. A great saving in fuel is also effected in diminishing the quantity of coal and wood required each morning on starting fires, besides the saving of time which is consumed in getting up steam. With this regulator connected with the boiler, the engineer can even add fresh coal to a good fire at quitting time, and close tightly every damper; in the morning he will find a full pressure of steam, a hot boiler, and with less than half the ordinary quantity of coal, and with opened dampers he will in ten minutes be in better condition for the business of the day than he possibly could be without the regulator in one hour's time, and with twice the quantity of fuel. Banking fires at night and filling up the boiler full of water to meet the wants of natural evaporation is not only injurious to the boiler, but a very dangerous practice, and has been the cause of many terrible explosions, attended by loss of life and destruction of valuable property.

6. The automatic attachment is not intended to relieve the Engineer of any of his present *responsibilities*. He must continue to give attention to the water feed but to provide for any want of vigilance in that respect, or the possibility of any stoppage of working, this automatic water feed regulator combines a steam whistle which sounds an alarm if the water is allowed to get one inch below the proper level; thus the Engineer is relieved of constantly attending to the pump, and has more time to devote to his other duties, freed from anxiety as to the state of the water in the boiler under his charge.

7. The alarm whistle is in itself of great value and worth to owners of boilers nearly the cost of the entire machine. The whistle is at all times reliable and sounds an alarm of great power when the water falls only one inch below the proper level, thus giving a loud and continuous warning for one hour or more before there is any possible danger from the insufficiency of water.

The experience in the use of the AUTOMATIC ENGINEER has been uniformly satisfactory and the following are a few of the testimonials received as to its great value :—

From the Engineer of the

CONTINENTAL FIRE INSURANCE COMPANY,

NEW YORK, February 2nd, 1882.

SALISBURY'S AUTOMATIC WATER FEED.

I am perfectly satisfied with its working, as it has never failed day or night, in keeping the water at a uniform level, no matter how fast or slow the boiler is generating steam. I find that the pump works fast or slow in answer to the evaporation of the water, and that owing to the perfect, slow, continuous movement of the pump, forcing the water through the heater to the boiler, it is much hotter than under the ordinary process. I am enabled to maintain a greater uniformity of steam pressure with a reduced quantity of fuel, and feel assured that pump as well as boiler will last much longer than without it. I sincerely believe that every engineer will appreciate your apparatus, no matter how prejudiced they may be at first. And the cost of the apparatus would not be considered an object by owners of steam boilers, when taken in connection with its great utility, safety and economy.

E. STIDWORTHY,

Engineer.

And again on the 22nd, of March 1882 Mr. Stidworthy gave the following additional testimony viz :

"I consider it the most valuable invention ever put upon a boiler ; the water in the boiler does not vary a sixteenth part of an inch during the entire day and in addition to the saving of fuel it saves a great amount of wear and tear upon the boiler in the way of expansion and contraction."

EDWARDS MANUFACTURING COMPANY,

421 E. 24th Street,

NEW YORK, Feb. 14th, 1882.

Prof. S. C. Salisbury,

DEAR SIR :

I have, in company with several other engineers, made a thorough examination and practical test of the utility and workings of your invention of an Automatic water-feed for boilers, and we are fully convinced of the great perfection and accuracy of the mechanical operation of the machine, as well as its great simplicity. Myself and associate engineers feel assured that you have overcome the objectionable features so frequently found in inventions of this nature, and we are satisfied that it will meet the full approbation of engineers and owners of boilers in general, and should be universally adopted.

D. EDWARDS.

Mr. Collins, the eminent Engineer of New York, of the firm of Dickinson and Collins, testifies as follows :

NEW YORK, February 17th, 1882.

"I have made a most thorough examination of all the mechanical parts comprised in the combination of Salisbury's machine, and find they are unlike any other invention, entirely free from every objectionable feature, and in its practical working it seems as near perfection as science can reach. It performs its work with perfect accuracy, maintaining a uniform water level in the boilers, prevents all contraction and expansion so injurious to boilers. One machine will regulate a bank of five or ten boilers, properly connected, just as well as one. As to its application to Railroad locomotives, I see no reason why it will not work unless it be too sensitive, and that can easily be overcome, and then it will be the most valuable invention ever applied. I will conclude by saying, properly managed, it will prove the most valuable invention ever offered to the public, when the loss of life and property are considered."

JERSEY CITY, February 25th, 1882.

SALISBURY'S AUTOMATIC FEED FOR BOILERS.

I hereby take pleasure in announcing my entire satisfaction of its practical operations. It is all you claim it to be—perfectly automatic in its work, maintaining under all the varied circumstances a uniformity of water in the boiler, obviating all the causes of change in temperature, which naturally would reduce the pressure, and overcoming the sudden contraction and expansion of the plates, which is so destructive to boilers. I see no chance of its ever failing to perform its duty faithfully, and feel assured such will be the opinion of every engineer, and no one using or in charge of steam boilers should be without this valuable attachment, which will protect life and property.

Yours truly,

MORAN,

Chief Engineer, P. LORILLARD & Co.

From MR. M. CREELMAN, *Inspector of* THE CANADIAN STEAM USERS INSURANCE ASSOCIATION, for Inspection and Insurance of Steam Boilers, &c. Head Office, Victoria Chambers, 9 Victoria Street, Toronto.

MONTREAL, 3rd April, 1882.

I have much pleasure in bearing testimony as to the merits of "Salisbury's Automatic Engineer" or "Feed Water for boilers." I have not only thoroughly examined the machine, but have seen it for a length of time in practical operation and I can safely state that it is one of the most needed inventions of the age as by its use, the explosion of boilers becomes almost an impossibility. Also it very much lengthens the life of the boiler by preventing the constant contraction and expansion from heat and cold, and further it is a great economiser of fuel and of the Engineers time. I will certainly recommend its use by all owners of boilers Insured

by the Company of which I am the Inspector of boilers and would strongly recommend its universal adoption by every one using or owning a steam boiler.

M. CREELMAN,

Boiler Inspector

For the Canadian Steam Users Insurance Association.

CORPORATION OF MONTREAL, FIRE DEPARTMENT,

Boiler Inspector's Office.

MONTREAL, 14 April 1882.

I hereby certify that I have thoroughly examined "Salisbury's Automatic Feed Water attachment" for Boilers, and have also watched it in practical working with a first class pump at Messrs. A. H. Sims & Co's. establishment for a length of time. It is as claimed for it a perfect Feed Water, maintaining uniformity of water in the boiler exactly to evaporation all the time.

And I would strongly recommend its universal adoption by all owners of Boilers.

ED. OCT. CHAMPAGNE,

Inspector of Steam Boilers for the City of Montreal.

MONTREAL, 15th April, 1882.

Messrs. H. Shackell & Co.

162 St. James Street.

DEAR SIRS,

We have had one of your Automatic Water Feed, attached to our Boiler. It has been working now for the past three weeks, night and day, without fail; I am perfectly satisfied with its working. After making a thorough examination of the works of apparatus I find it is very simple in its construction, I see no way for it to get out of order. The advantage I find in this apparatus

is that the water is kept at a uniform level and that the Steam Pump works fast or slow, according to the evaporation of water consumed and that the Steam Pump working so steady all the time, the water on entering the Boiler is much hotter than the ordinary way; it saves fuel and easier to keep steam. I feel assured that both Steam Pump and Boiler will last much longer than without it. I believe every Engineer in using one of these apparatus will appreciate it, no matter how prejudiced they may be at first, and that Proprietors when taking in consideration the safety, economy and simplicity of apparatus, will not find the cost an object, as I feel assured that the apparatus will pay for itself in a little while, and preventing all boiler explosions for the want of water. I can safely recommend it to any one using Steam Boilers, and that it is all it is claimed to be.

Yours respectfully,

JOHN D. BUTT,

Engineer to

A. H. SIMS & Co.

29, 31 and 33 St. Peter Street,
Montreal.

These regulators can be adjusted to every type of boiler—horizontal, tubular, vertical, plain cylinder and sectional, of every form; also to Banks of Boilers; and they can be readily fitted by any good engineer or machinist.

For prices and further information apply to the undersigned

H. SHACKELL & CO.

(P. O. Box 1636)

162 ST. JAMES STREET,

MONTREAL.

Sole Agents for the Dominion.

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